

Surface Water Drainage Proposal Checklist

Ground Investigation Results				
Results Required		Results Provided?		
Winter groundwater monitoring results (Please refer to guidance note 1 below)		Yes	☒	No
Period of winter groundwater monitoring Note 1		From	21/12/2018	
		To	25/03/2019	
Maximum recorded groundwater level			800 mm	mAOD mBGL
Winter infiltration test results Note 2		Yes	☒	No
Date of winter infiltration testing			24/03/2019	
Details of the location and depth of the infiltration testing Note 3		Yes	☒	No
Minimum infiltration rate Note 4			5.39 x 10 ⁻⁶ m/s	

Guidance Notes

- Groundwater monitoring should be undertaken during the wet winter months, (October to March) to enable the peak annual groundwater levels to be established. The extent of winter monitoring should be discussed with the council's Engineers.
- Infiltration testing should be undertaken during the wet winter months, (October to March) and in line with BRE365, or a similar approved method. Tests should be repeated 3x, to replicate saturated ground conditions.
- Infiltration testing should be undertaken at the location and depth of any proposed infiltration structures. This must be above the maximum recorded groundwater level in that vicinity.
- The minimum infiltration rate obtained at the location and depth of the proposed infiltration structures should be used to inform the design of the structures.

Proposed Method of Surface Water Disposal				
Infiltration	Yes	☒	No	
On-site, via soak-away structures				
If on-site infiltration is not to be used, has justification for this been provided? Note 5	Yes		No	☒
Attenuation (on-site) with a restricted discharge to a watercourse on, or adjacent to, the site	Yes		No	☒
Attenuation (on-site) with a restricted discharge to a surface water sewer on, or adjacent to, the site	Yes		No	☒
Attenuation (on-site) with a restricted discharge to a foul water sewer on, or adjacent to, the site	Yes		No	☒

Guidance Notes

- If on-site infiltration is not being used to drain the site you will need to provide evidence that demonstrates on-site infiltration is unviable.

Drainage Design: Supporting Calculations					
Calculations Required				Calculations Provided?	
Infiltration Structures	Half-drain time for 10 year event (plus climate change allowance)	Yes	☒	No	☐
		Hours			
	Half-drain time for 100 year event (plus climate change allowance)	Yes	☒	No	☐
		Hours			
	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes	☒	No	☐
	Lowest base level of infiltration structure	mAOD 700mm mBGL			
	Has the design sought to provide treatment of potential contaminants? i.e. hydrocarbons.	Yes	☐	No	☒
Attenuation and Subsequent Restricted Discharge	Pre-development run-off rate calculations	Yes	☐	No	☐
		l/s			
	Proposed discharge rate Note 6	l/s			
	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes	☐	No	☐
	Has the design sought to provide treatment of potential contaminants? i.e. hydrocarbons.	Yes	☐	No	☐
	If your proposed scheme incorporates any impermeable lined attenuation features we require calculations to demonstrate that appropriate resistance to floatation (due to groundwater levels) is catered for in the design	Yes	☐	No	☐
	If you propose discharging into or altering an ordinary watercourse; have you sought Ordinary Watercourse/Land Drainage Consent? Note 8	Yes	☐	No	☐
	If discharging to a watercourse, piped system or the sea, has the proposed drainage network been modelled against predicted top water levels for the 1 in 100 year storm event plus climate change allowance, within the existing system? Note 9	Yes	☐	No	☐

Guidance Notes

- Any proposed discharge rate must be less than, or equal to, the pre-development rate. Greenfield sites must use the mean flow rate (Q_{bar}). Additionally, if you are developing a brownfield site, we expect you to provide fully detailed plans of the existing surface water drainage arrangements on site, including impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc.
- The appropriate factor of safety from the table below must be applied to your calculations to ensure your design is fully in accordance with CIRIA R156/ CIRIA C609.

Factor of Safety Table						
Size of Area to be Drained	Consequences of failure					
	No damage or inconvenience		Minor inconvenience, e.g. surface water on car park		Damage to buildings or structures or roads.	
	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75
<100 m ²	1.5	2	2	3	10	13
100m ² to 1000m ²	1.5	2	3	4	10	13
>1000m ²	1.5	2	5	6.5	10	13

8. [Ordinary Watercourse/Land Drainage Consent](#) will need to be sought, ideally in parallel with planning permission, if you propose discharging into, culverting or altering a watercourse.
9. Modelling is required to ensure that problems, such as surcharged outfalls, are addressed.

Plans/Drawings/Diagrams				
Required	Provided?			
Plan detailing the location of groundwater monitoring and infiltration testing	Yes	☒	No	☐
Detailed drainage layout plan ^{Note 10}	Yes	☒	No	☐
Construction detail plans ^{Note 11}	Yes	☐	No	☒
Exceedance flow route plans ^{Note 12}	Yes	☐	No	☒
Impermeable area plan	Yes	☒	No	☐
If ground levels are being raised $\geq 300\text{mm}$ above existing levels and is unavoidable, have fully detailed plans been provided, together with drainage proposals, to address any potential drainage related issues.	Yes	☐	No	☒
If any part of the development site is within recognised flood plain i.e. 1 in 100 & 1 in 200 year fluvial/tidal events, have plans been provided showing the extents, together with any proposals for ground raising/displacement within these areas. ^{Note 13}	Yes	☐	No	☒

Guidance Notes

10. Drainage layout plans should include:
 - All surface water drainage pipes labelled with; diameters, pipe materials, falls and invert levels.
 - All infiltrating and attenuating structures (including permeable paving) labelled with; dimensions, invert and cover levels.
 - All manholes labelled with; cover levels, invert levels, cover types detailed.
 - All silt traps clearly labelled with sump depths.
 - Control structures with outflow rates and invert levels.
 - Proposed/existing levels of any areas subject to ground raising, together with suitable measures/detailed drawings for the associated management of surface water runoff. Please note that ground raising should be avoided unless there are exceptional circumstances.
11. Site specific construction detail plans should be supplied if your proposed drainage scheme includes any of the following elements: pipe bed and surround; infiltrating structures; attenuating structures; manholes; catch-pits/silt traps; control devices; permeable paving; headwalls.
12. Unless specifically requested by the council's drainage engineers 'Exceedance Flow Route Plans' are only required for developments of more than 5 properties.
13. Product 4 'Detailed flood risk assessment mapping data' (available from the Environment Agency) must also be provided in support. Plans/details will be required to mitigate any unavoidable loss of flood plain/storage. Please also be aware that Environment Agency approval of such proposals will also be required.

Version 2.0 (13.06.2019)